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कृषि पहियेदार ट्रैक्टर के संस्थापन की रीति संहिता

(पहला पुनरीक्षण)

Indian Standard

CODE OF PRACTICE FOR INSTALLATION OF AGRICULTURAL WHEELED TRACTOR

(First Revision)

ICS 65.060.10

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

November 1995

Price Group 3

Agricultural Tractors and Power Tillers Sectional Committee, FAD 32

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Agricultural Tractors and Power Tillers Sectional Committee had been approved by the Food and Agriculture Division Council.

Agricultural wheeled tractor is a sophisticated prime mover and involves heavy initial investment. It is, therefore, imperative that it is utilized for reasonably long working hours for several years and the cost of operation is minimized. Though basic design of the tractor and quality of the materials used for its different components are important, proper installation of the tractor is equally important in achieving these objectives.

Installation of an agricultural wheeled tractor should include the following:

a) Predelivery checks and service,

b) Guidance for matching implements,

c) Delivery,

d) Running-in,

e) Training and familiarization to the user in operation and setting of the tractor to suit the land and the cropping pattern, and

f) Instructions regarding free servicing and periodical maintenance to be carried out.

A properly installed tractor is most likely to give trouble-free service to the user and this would create goodwill between the supplier and the user and would also give popularity to the manufacturer. Hence, it is essential that at every step the supplier takes all the precautions in installing a tractor. This code provides guidelines for installation of the tractor which should be helpful to the supplier and the user.

This standard was first published in 1972. The revision of this standard has been taken up to incorporate modification in various clauses based upon actual trade practice for the benefit of users.

Indian Standard

CODE OF PRACTICE FOR INSTALLATION OF AGRICULTURAL WHEELED TRACTOR

(First Revision)

1 SCOPE

1.1 This standard provides guidelines for installation of agricultural wheeled tractor.

2 REFERENCES

The following Indian Standards are necessary adjuncts to this standard:

IS No.	*Title*
6840 : 1972	Code of practice for preventive maintenance of agricultural tractors
9864 : 1981	Guidelines for stocking spare parts of agricultural tractors.

3 TERMINOLOGY

3.0 For the purpose of this standard, the following definitions shall apply.

3.1 Agricultural Tractor

A self-propelled vehicle having wheels or tracks, designed primarily to operate trailed or mounted agricultural implements and machines, including trailers, and to supply power to operate them with the vehicle itself in motion or remaining stationary.

3.2 Agricultural Wheeled Tractor

An agricultural tractor in which wheels are the driving members.

3.3 Installation

Operations performed to make the tractor field-worthy to give trouble-free service for maximum working hours.

3.4 Manufacturer

Any person or organization who actually manufactures tractor components fully or partialy and assembles the tractor.

3.5 Supplier

Any person or organization appointed or recognized by the manufacturer for sale of the tractor of his make. The manufacturer may or may not be a supplier.

3.6 User

Any person or organization who purchases and uses the tractor.

3.7 Operator

A person who actually operates the tractor. An operator may or may not be the user.

4 PREDELIVERY CHECKS AND SERVICE

4.1 Predelivery checks and service of the tractor should be done to the satisfaction of the user.

4.2 The complete service of the tractor including lubrication should be made in accordance with the manufacturer's recomendations or as per guidelines for predelivery check list as given in Annex A.

4.3 The functioning of the tractor and its different components should be checked and shown to the user.

5 MATCHING IMPLEMENTS

5.1 As the tractor is only a prime mover, it can be handled efficaciously when right type of implements are used with it. It is, therefore, essential that the supplier should recommend the matching implements and should give adequate information regarding type of the implements along with their specifications and the addresses of the manufacturers and the suppliers.

6. DELIVERY

6.1 At the time of delivery the supplier should hand over all the documents and literature to the user. A list of the documents and literature recommended to be supplied is given in Annex B.

6.2 The supplier should provide a set of adequate tools for routine maintenance of the tractor. A list of the tools is to be mentioned in the operator's manual. A list of standard and optional accessories should also be given in the operator's manual and this is to be explained to the customer.

6.3 The manufacturer is to make a list of fast-wearing components of the tractor for the guidance of the user in the operator's manual. User may be advised to stock these items to maintain serviceability of the tractor. Guidelines may be taken from IS 9864:1981.

7 RUNNING-IN

7.1 The new tractor needs to be run in to make all its parts to move freely and smoothly. During this period, the pistons, piston rings, cylinders, valves, valve seats, bearings, etc, get proper seat and settling down through lubrication.

7.2 The supplier should instruct the user regarding proper method of running-in of the tractor engine and transmission. These instructions may also be included in operator's manual. A recommended procedure for running-in the tractor is given in Annex C, which may be followed if the manufacturer has not given instructions in this regard in the operator's manual.

8 TRAINING AND FAMILIARIZATION

8.1 Generally the users are not conversant with the tractor in its driving and control. It is essential on the part of the supplier to impart training to the user in order to familiarize him in different aspects of running-in, maintenance, servicing and checking of the tractor. Also utilization of the tractor effectively alongwith recommended accessories to be explained and demonstrated. Training should cover all the operations/accessories for which the tractor is recommended.

8.2 The manufacturer should provide instruction on precautions and safety procedure for the operation of the tractor and safety of the operator for common agricultural operations.

9 FREE SERVICE AND PERIODICAL MAINTENANCE

9.1 The user should be informed regarding periodical maintenance (*see* **6** of IS 6840 : 1972) and free services. These are to be specified in the operator's manual. Where norms of maintenance and free service are not followed during warranty period, consequence of loss of warranty and damage to machine to be highlighted.

9.2 The supplier should send the information to the user about the date and place for free service well in advance.

9.3 The place for free service should be, as far as possible, the user's point or the nearest service station recognized by the supplier.

9.4 The user should not attempt to service the tractor himself as defects can generally be observed only by the trained mechanic of the supplier.

9.5 Operations recommended to be performed during free service are to be listed on the free service coupon.

ANNEX A

(*Clause* 4.2)

CHECKS AND OPERATIONS TO BE PERFORMED DURING PREDELIVERY

A-0 Predelivery checks and service should be done for the following:

a) Cooling system;
b) Lubrication system;
c) Air cleaner system;
d) Fuel system;
e) Transmission and wheel system;
f) Hydraulic system; and
g) Electrical system;

A-1 COOLING SYSTEM

A-1.1 Ensure that:

a) the radiator is clean and not leaking;
b) the block and the head are clean;
c) there is no leakage in the head gasket;
d) the fan bearings are lubricated and there is no end play in the bearings;
e) the tension of the belt is proper;
f) there is no abnormal noise in the water pump assembly;
g) the hoses, drain cocks and gaskets are in proper order;
h) the thermostat is working properly; and
j) the fins, wherever provided, are clean (in the case of air-cooled engines).

A-2 LUBRICATION SYSTEM

A-2.1 Ensure that:

a) the crankcase is fillled up to the prescribed level with fresh lubricating oil of the grade recommended by the manufacturer;
b) the breather cap, if provided, is cleaned; and
c) the oil pressure in gauge is correct and oil pressure warning light, if provided, is functioning properly.

A-3 AIR CLEANER SYSTEM

A-3.1 Ensure that:

a) the oil cup is clean;
b) the paper element is clean;

c) the paper element is free from punctures (Discard it, if it has even a pin-point puncture);
d) the plastic sealing rings on the upper and the lower sides of the element are smooth;
e) the air intake pipe is free from dirt;
f) the cup has been filled with clean oil up to the level mark; and
g) the hose and the clamps are clean.

A-4 FUEL SYSTEM

A-4.1 Ensure that:

a) the sediment bowl is clean;
b) the fuel tank, lines and fittings are clean;
c) the fuel filter cap's vent-hole is clean;
d) the injectors are developing proper pressure (In case there are signs of dribbling, the injector should be dismantled and the needle valve, seat, spring and nozzle checked and cleaned with the cleaning set. The injector should be reassembled and tested again for proper pressure.);
e) the fuel is of proper grade and up to the desired level;
f) the overflow pipe is clean; and
g) the air cleaner, if installed in fuel tank filler cap, is clean.

A-5 TRANSMISSION AND WHEEL SYSTEM

A-5.1 Ensure that:

a) there is no oil in the clutch housing;
b) the clutch has been adjusted properly to restore the free movement of the clutch pedal;
c) the transmission housing has been filled with the proper grade of lubricant up to the desired level;
d) the final drive and the rear axle bearing are properly lubricated; and
e) the tyres are properly inflated and fitted in the correct position.

A-6 HYDRAULIC SYSTEM

A-6.1 Ensure that:

a) the storage tank is filled with the proper grade of hydraulic fluid up to the desired level. (This is necessary only when the hydraulic system is separate with its own tank and is not dependent on any other system of the tractor such as transmission.);
b) the system is free from dirt and dust;
c) all fittings and connections are clean and there is no leakage;
d) the control valve, relief valve and cylinder are functioning properly; and
e) the system is capable of developing proper force required to activate the implement for attachment.

A-7 ELECTRICAL SYSTEM

A-7.1 Ensure that:

a) there is no crack or swelling in the battery container;
b) all cells of the battery are live;
c) the electrolyte has the correct specific gravity;
d) the electolyte is present up to the desired level;
e) the battery connections are correct;
f) all connections, fuses and switches are intact;
g) the system is developing the correct voltage;
h) the dynamo is functioning properly; and
j) all bulbs light, and the horn is functioning properly.

ANNEX B

(*Clause* 6.1)

LIST OF DOCUMENTS AND LITERATURE

1. Sale letter
2. Warranty certificate
3. Free-service coupons
4. Spare parts catalogue
5. Temporary registration number
6. List of tools and accessories supplied with the tractor
7. List of spare parts supplied with the tractor
8. List of fast-wearing components
9. Lubrication chart and owner's maintenance manual

ANNEX C

(*Clause* 7.2)

METHOD OF RUNNING-IN OF THE TRACTOR

C-1 GENERAL

C-1.1 Never put at once a new or repaired tractor into operation under full load as it leads to increase wear and sometime to failure. Prior to full loading, the tractor should be run-in.

C-2 PREPARATION OF THE TRACTOR FOR RUNNING-IN

C-2.1 Clean the tractor of dust and dirt. Wash off the grease with diesel oil.

C-2.2 Tighten all outer fastenings.

C-2.3 Lubricate all points according to the lubrication chart.

C-2.4 Check oil in crankcase, gear box and hydraulic pump and top up if necessary.

C-2.5 Fill the fuel tank with the fuel and the cooling system with water.

C-2.6 Check the air pressure in the tyres. (The tractor is dispatched from the works with tyre pressure above normal. When preparing the tractor for the running-in, excess of air should be bled and pressure lowered to normal.).

C-2.7 Check the operation of the hydraulic lift mechanism as indicated in the owner's maintenance manual.

C-3 STAGES

C-3.1 Unless otherwise stated in the owner's maintenance manual, the stages of running-in of the tractor shall be as follows:

a) Running-in at idling for 15 to 20 minutes,
b) Running-in under no-load condition for 10 hours using different gears, and
c) Running-in under varying loads for 45 hours using all controls.

C-4 PROCEDURE

C-4.1 Running-In at Idling

C-4.1.1 Start the engine in accordance with the instructions given in the owner's maintenance manual.

C-4.1.2 Keep the radiator cap tightly closed during the running-in.

C-4.1.3 Let the engine work for 10 minutes at 500 to 600 rev/min. Listen carefully the sound of the engine for any noise and at the same time, observe the readings of the instruments on the panel and watch the joints for any leakage.

C-4.1.4 Having run the engine for 2 to 3 minutes, operate the hydraulic lift.

C-4.1.5 When the engine has run for 10 minutes at low speed, increase its speed to the rated rev/min and check its performance as in **C-4.1.3**.

C-4.1.6 At the end of the running-in, check the engine for stable operations at various speed starting from the minimum rev/min.

C-4.1.7 Check the accuracy of the clutch engagement and disengagement and the operation of the lighting system.

C-4.1.8 Having eliminated the faults detected, proceed to run-in the tractor under no-load condition.

C-4.2 Running-In Under No-Load Condition

C-4.2.1 Run the tractor for about 1 hour in each gear in each of the forward and reverse directions, beginning from the first gear, to a maximum of 10 hours.

C-4.2.2 During the running-in, take sharp turns to both sides, with use of brakes in the first and second gear and smooth turning in the higher gears.

C-4.2.3 Check the following during the running-in:

a) Operation of the engine and reading of the instruments,
b) Correct adjustment and proper release of the clutch,
c) Easy shifting of the gears and operation of the interlocking mechanism,
d) Controllability of the tractor and reliability of the brake operation, and
e) Operation of the electrical equipment.

C-4.2.4 Having eliminated the faults detected, proceed to run-in the tractor under load condition.

C-4.3 Running-In Under Load

C-4.3.1 Distribution of working time under varying load and speeds while running-in the tractor should be as given below:

Throttle Opening	*Running-in Time in Each Gear*					*Total Running-in Time, h*
	Neutral	First Gear	Second Gear	Third Gear	Fourth Gear	
1/4	1	3	3	3	4	14
1/2	1	5	5	4	—	15
3/4	—	5	7	—	—	12
Full	—	4	—	—	—	4

C-4.3.2 Listen the sound of the engine for any noise and observe the working of the engine and of transmission system during the total running-in period.

C-4.3.3 Eliminate the faults detected during the running-in.

C-4.3.4 After completing the running-in, perform the following operations:

a) Drain oil, when it is still hot, from the crankcase, main drive, final drive hydraulic lift, wheel hub, fuel injection pump and governer housing, flush with diesel oil or flushing oil, and refill with the proper grade of oil;

b) Clean or replace the oil filter, and renew oil in air-cleaner oil pan;

c) Check the oil level in the belt-pulley housing, and top up if necessary;

d) Grease the water pump, front wheel bearing, hydraulic lift joints and tie-rod ends;

e) Drain water from cooling system, and flush and refill the system with clean water;

f) Clean the magnet breaker contacts;

g) Tighten the cylinder head fastening nuts, and check the tappet clearance; and

h) Tighten all outer fastenings.

C-4.3.5 After completing the running-in under load, put the tractor into normal operation.

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BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones : 331 01 31, 331 13 75

Telegrams : Manaksanstha
(Common to all offices)

Regional Offices :		Telephone
Central	: Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	331 01 31 331 13 75
Eastern	: 1/14 C. I.T. Scheme VII M, V. I. P. Road, Maniktola CALCUTTA 700054	37 84 99, 37 85 61 37 86 26, 37 86 62
Northern	: SCO 335-336, Sector 34-A, CHANDIGARH 160022	60 38 43 60 20 25
Southern	: C. I. T. Campus, IV Cross Road, MADRAS 600113	235 02 16, 235 04 42 235 15 19, 235 23 15
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